

CLAIMS:

Sub A > 1. A network, comprising:

Sub B 2 a first node comprising a first plurality of first-in, first-out (FIFO) queues arranged for
3 high priority to low priority data movement operations; and

Sub C 4 a second node operatively connected to said first node by multiple control and data
5 channels, said second node comprising a second plurality of FIFO queues arranged in
6 correspondence with said first plurality of FIFO queues for high priority to low priority data
7 movement operations via said multiple control and data channels;

Sub D 8 wherein an I/O transaction is accomplished by one or more control channels and data
9 channels created for moving commands and data separately between said first node and said
10 second node during said data movement operations, in the order from high priority to low
11 priority.

1 2. A network as claimed in claim 1, wherein said control channels are used to

2 prioritize command processing, and each control channel is assigned with a different priority by
3 one of the nodes that is en-queuing the commands to be executed based on the quality of service
4 desired.

1 3. A network as claimed in claim 2, wherein said first plurality of FIFO queues

1 include a high priority FIFO queue provided to queue commands for urgent traffic, a low priority
2 FIFO queue provided to queue commands for normal traffic, and another FIFO queue provided to
3 queue data for data movement operations.

4. A network as claimed in claim 1, wherein said data is transmitted in groups of cells
with each cell having a header utilized for indicating whether the cell is transmitted in a priority
order.

5. A network as claimed in claim 4, further comprising a multi-stage switch which
comprises a plurality of different routes for connecting said first node and said second node for
data movement operations.

6. A network as claimed in claim 4, wherein each of said first node and said second
node includes one or more channel adapters configured with a multiplexing function based on a
priority order for multiplexing and transmitting back to back cells of the same priority from
multiple FIFO queues through assigned control or data channels.

7. A network as claimed in claim 2, wherein said data is spread between multiple data
channels to prioritize data processing while concomitantly decreasing latency and increasing
bandwidth during said data movement operations.

1 8. A network as claimed in claim 1, wherein said first node and said second node are
2 channel endpoints of the network implemented in compliance with the "*Next Generation*
3 *Input/Output (NGIO) Specification*".

1 9. A network as claimed in claim 8, wherein said multiple control and data channels
2 are directly supported by the "*Virtual Interface (VI) Architecture Specification*" and the "*Next*
3 *Generation Input/Output (NGIO) Specification*" for multiple priorities of traffic to allow for
4 varying types of information to pass between endpoints with varying precedence.

5 10. A network arrangement, comprising:

6 a host system;

7 at least one remote system;

8 a switch fabric comprising a plurality of different switches which interconnect said host
9 system to said remote system along different control and data channels for data movement
10 operations;

11 said host system comprising multiple first-in, first-out (FIFO) queues arranged for high
12 priority to low priority data movement operations; and

13 said remote system comprising multiple first-in, first-out (FIFO) queues arranged for high
14 priority to low priority data movement operations;

1 wherein an I/O transaction is accomplished by one or more control channels and data
2 channels created for moving commands and data separately between said host system and said
3 remote system during said data movement operations, in the order from high priority to low
4 priority.

1 11. A network arrangement as claimed in claim 10, wherein said control channels are
2 used to prioritize command processing, and each control channel is assigned with a different
3 priority by one of the nodes that is en-queuing the commands to be executed based on the quality
4 of service desired.

1 12. A network arrangement as claimed in claim 10, wherein said FIFO queues of one
2 of said host system and said remote system include a high priority FIFO queue provided to queue
3 commands for urgent traffic, a low priority FIFO queue provided to queue commands for normal
4 traffic, and another FIFO queue provided to queue data for data movement operations.

1 13. A network arrangement as claimed in claim 10, wherein said data is transmitted
2 from said host system to said remote system in groups of cells with each cell having a header
3 utilized for indicating whether the cell is transmitted in a priority order.

1 14. A network arrangement as claimed in claim 13, wherein each of said host system

1 and said remote system includes one or more channel adapters configured with a multiplexing
2 function based on a priority order for multiplexing and transmitting back to back cells of the same
3 priority from multiple FIFO queues through assigned control or data channels.

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15. A network arrangement as claimed in claim 10, wherein said data is spread
between multiple data channels to prioritize data processing while concomitantly decreasing
latency and increasing bandwidth during said data movement operations.

16. A network arrangement as claimed in claim 10, wherein said host system and said
remote system are channel endpoints of the network implemented in compliance with the "*Next
Generation Input/Output (NGIO) Specification*".

17. A network arrangement as claimed in claim 10, wherein said multiple control and
data channels are directly supported by the "*Virtual Interface (VI) Architecture Specification*"
and the "*Next Generation Input/Output (NGIO) Specification*" for multiple priorities of traffic to
allow for varying types of information to pass between said host system and said remote system
with varying precedence.

18. A method for providing prioritized data movement between a source node and a
destination node in a data network, said method comprising:

1 establishing one or more control channels and one or more data channels between said
2 source node and said destination node for transferring commands that describe data movement
3 operations from said source node to said destination node and for moving data from said source
4 node to said destination node;

5 assigning a logical priority to each control channel for transferring high priority commands
6 to move across the control channel before low priority commands during said data movement
operations; and

7 transferring, at said source node, data in groups of cells to said destination node along the
8 data channel.

9 19. A method as claimed in claim 18, further comprising:

10 assigning a logical priority to each data channel for high priority data to move across the
11 data channel before low priority data during said data movement operations; and

12 moving, at said source node, high priority data in groups of cells to said destination node
13 along the data channel before low priority data during said data movement operations.

14 20. A method as claimed in claim 18, wherein said data is transmitted from said source
15 node to said destination in groups of cells with each cell having a header utilized for indicating
16 whether the cell is transmitted in a priority order.

1 21. A node comprising:

2 a first plurality of first-in, first-out (FIFO) queues arranged for high priority to low priority

3 data movement operations; and

4 an interface for operatively coupling said node to another node by multiple control and

5 data channels, such that an I/O transaction is accomplished, by one or more control channels and

6 data channels created for moving commands and data separately between said node and said

7 another node during said data movement operations, in order from high priority to low priority.

8 22. A computer-readable medium that stores computer-executable instructions for

9 transferring commands and data from a first node to a second node, said instructions causing a

10 computer to:

11 arrange a first plurality of first-in, first-out (FIFO) queues, located within the first node,

12 for high priority to low priority data movement operations; and

13 operatively couple said first node to said second node by multiple control and data

14 channels, such that an I/O transaction is accomplished, by one or more control channels and data

15 channels created for moving commands and data separately between said node and said another

16 node during said data movement operations, in order from high priority to low priority.

17 23. A computer-readable medium that stores computer-executable instructions for

18 transferring commands and data from a source node to a destination node, said instructions

- 1 causing a computer to:
 - 2 establish one or more control channels and one or more data channels between said source
 - 3 node and said destination node for transferring commands that describe data movement
 - 4 operations from said source node to said destination node and for moving data from said source
 - 5 node to said destination node;
 - 6 assign a logical priority to each control channel for transferring high priority commands to
 - 7 move across the control channel before low priority commands during said data movement
 - 8 operations; and
 - 9 transfer, at said source node, data in groups of cells to said destination node along the data
 - 10 channel.